Seismic belts of northeast Russia are spatially confined to the boundaries of lithospheric plates (North American, Eurasian, Okhotomorsk and Chinese) where specific parageneses of seismogenic structures are formed.

The boundary between the Eurasian and Chinese (Amurian) plates in marked by the Baikal-Stanovoy seismic belt representing a band of earthquake epicenters extending along the southern margin of the Siberian platform from Lake Baikal in the west to Uda Bay of the Sea of Okhotsk in the east. Since the beginning of the 20-th century some 200 thousand local events have been recorded there. The largest of them had $M=6.5-8.0$. The belt can be divided into two parts: the western part in which the Baikal rift zone is developed, and the earthen one which is referred to as the independent Olekma-Stanovoy seismic zone. Both parts originated within the limits of the same Baikal-Stanovoy orogen, but they differ significantly in both the seismic regime and geodynamic environments at which the structures formed.

The Baikal rift zone is marked by a stable horizontal extension of the Earth’s crust. A system of basins are forming here, which are surrounded by mountain ridges. Sedimentation processes are active in the region, as evidenced by the growing size of the basins as a result of destruction of their divides. This is considerably supported by the facts that the seismic activity maxima tend to occur within these divides and the basins themselves and that the forming seismogenic faults are dominated by normal and strike-slip faults (from focal mechanisms evidence).

Contrastingly, seismotectonic processes in the Olekma-Stanovoy zone (OSZ) are taking place under compression conditions. The change of the tectonic stress field occurs in the mid Olekma river area where a transitional seismic regime is observed. The frequency of seismic events here is four times less than in the Baikal rift zone. Neotectonic structures of the OSZ are represented by the Stanovoy Ridge system consisting of separate en-echelon mountain structures such as the Zverev and Sutam-Gonam Ridges and the Toko Stanovik. From geophysical data, they represent a large crust piling zone. On the north, the zone is surrounded by mesozoic South Yakutian basins comprising the Pre-Stanovoy depression.

The system of active seismogenenerating faults has a complex pattern, and is traceable as a zombic net of sublatitudinal, north-east and north-west strike. Their kinematics corresponds to strike-slips, thrusts and reverse faults.

Another large seismic belt, the Arctic-Asian, is confined to the boundary between the Eurasian and North American lithospheric plates. It connects the seismicity of the mid-arctic Gakkel Ridge in the Arctic region with the seismic events in the Chersky Range, Sea of Okhotsk and Kamchatka mountain system. The belt is characterized by frequently changing geodynamic conditions. The structures developed within the mid-arctic Gakkel Ridge and its zone of influence. Traced in the Arctic ocean as far as the Laptev Sea coast, originated under rifting conditions. The eastern part of the Laptev Sea shelf occupied by the Laptev Sea rift system which is a continuation of the Gakkel Ridge and consists of a number of grabens and their separating uplifts. Some of the grabens are traceable onto the continent (from geophysical data). Maximum seismic activity is restricted to the sides of the grabens and their axial parts. The extension regime changes (from focal mechanisms and geological - structural evidence) into a mixed tectonic stress field reported in North Verkhoyznye where normal fault, strike-slip fault, upthrow fault and thrust motions are observed in the earthquake foci. The most active here is the Kharaulakh normal fault and strike-slip fault system cross-cutting the western spurs of the homonymous ridge. It is to this system that the 1927-1928 Bulun events with a magnitude of 5-7 are related.
Southeasterly, within the limits of the Chersky Range seismic zone, occupying the central part of the Arctic-Asian seismic belt, the compression conditions prevail. Focal mechanism diagrams and detailed structural-geological data indicate that equally developed here are longitudinal left-lateral strike-slip faults of north-west strike and thrusts and reverse faults oriented parallel to them, which may well be explained by a transpression regime (compression with sliding) dominating on the territory. Of interest is the fact that the axial part of the Chersky Range seismic zone is spatially coincident with the intracontinental Moma rift system developed in the Late Miocene-Middle Pleistocene which has lost its activity by now and is not involved in the formation of seismogenic structures of the region. In the conditions of horizontal compression well established from seismological evidence and GPS observations a narrowing of some of the Moma basins is taking place and their surrounding ridges take on a specific S-shaped bend. The en-echelon systems of large left-lateral strike-slip faults formed on their terminations pull-apart basins (Upper Nera, Bugchan, Kadykchan, etc.) to which recent seismicity is confined. The Moma-Selennykh basin system is practically aseismic.

Thus, the analysis of active geological structures in northeast Russia shows that their evolution follows the laws of lithospheric plates tectonics and may be used for explaining the nature of seismic processes occurring in the region.